CREATIVITY: AN OVERVIEW

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Objective: This article examines creativity from a psychological perspective. It outlines some basic theories of creativity from a 4-Ps view: Process, Product, Person and Press of environment. Then it outlines some well known models of the creative process.

Creativity has been a difficult concept to define, and exploring the subject of creativity might be a very hard task. Any work that aims to study creativity should better focus on only few aspects of its wide phenomena (Hinshelwood, 2006).

Experts in many fields have put forward a number of different theories highlighting various aspects and dimensions of creativity.

Here are explored some basic outlines of creativity that would help designing a collective frame for this research. They include various definitions of creativity and some ways of approaching its study.

Definitions of Creativity

When we look into Oxford Dictionary, it says "Creativity is the use of imagination or original ideas in order to create something" (Oxford Online, 2006).

Greenacre (1959) wrote, "I use the term creativity to mean, the capacity for or activity of making something new, original or inventive, no matter in what field. It is not merely the making of a product, even a good product, but of one which has the characteristic of originality."

Those definitions may raise the following question: what about bringing a new method of killing into being? Is that creativity? (Hinshelwood, 2006).

Preti (2003) believes that creativity could be described as the ability to create products or ideas which are original and which possess a <u>strong social usefulness</u>. This definition, however, is not the whole answer to Hinshelwood's question.

Frank Barron, one of the most important researchers in this field, offers a more articulate definition of creativity. First, creativity is considered in terms of the characteristics of the creative product and the social acknowledgements obtained. A criterion of <u>usefulness</u> is implied in this definition. Secondly, the creative product can be considered in its own context: the difficulty of the problem resolved or identified, the elegance of the solution proposed, the impact of the product itself. Thirdly, creativity can be conceived on the basis of the abilities that favor it (Barron and Harrington, 1981).

Eminent and Everyday Creativity

Creativity researchers acknowledge that the concept of creativity is not limited to that special group of individuals who demonstrate talent within a specific domain. Richards (1990) provides conceptual definitions of creativity that distinguishes between what she calls "eminent creativity" and "everyday creativity". Richards defines eminent creativity as follows:

> *By eminent creative accomplishments, we mean endeavors, which have received some form of social recognition, such as prizes, awards, or special citations from society at large or from major professional groups…Eminent creative accomplishment is often concentrated in the traditionally creative areas of the arts and sciences (p. 303).*

Then she provides the following definition of everyday creativity:

> *Everyday creativity is not constrained to "traditionally creative" areas and carries no requirement for social recognition. Everyday creativity may be identified solely in terms of the widely accepted criteria of originality and meaningfulness to others (p. 305).*

This distinction between two types of creativity allows for the inclusion of the kinds of creative outputs that result from daily adaptations and innovations. <u>Further, the definition of everyday creativity opens the door to the inclusion of psychotherapy within a creativity paradigm.</u>

Ways of Studying Creativity

Human creativity can be examined from various different angles and conceptual frameworks. Richards (1990) talked about the Four P's of Creativity: *process*, *product*, *person*, and environmental *press*. Taylor (1959) demonstrates that there are at least four levels of creativity as he has differentiated: expressive, productive, inventive and innovative creativity. Giovacchini (1991) talked about scientific and artistic creativity.

This review is adopting the Four P's approach, as it provides a structure that enables to situate various theoretical perspectives within the current field of knowledge in creativity research. It will be presented as follows:

A- Creative Process:
1- Creative Process from a Psychoanalytic Perspective
a- Freud
b- Ernst Kris
c- Melanie Klein
d- Fairbairn
e- Winnicott

f- Silvano Arieti

2- Creative Process from a Humanistic Perspective

a- Carl Rogers

b- Gestalt

c- Transactional Analysis

B- Creative Product

1- What is a Creative Product?

2- Qualities of a Creative Product

C- Creative Person

1- Primary Features

2- Additional Characteristics

3- Personality Traits

4- Intelligence and Wisdom

D- Creative Environment (Environmental Press):

1- Family Environment

2- Social/cultural Environment

A-   Creative Process:

Various branches of psychology have different views of human experience which influence their theories of creativity. It is evident that there are common threads in many of those theories. All of them see creativity as an encounter with and merging of divergent information but they disagree about the source of that information and the procedure through which it is processed (Bergquist, 2000). Here, the process of creativity is explored from 2 main theoretical perspectives: Psychoanalytic (Freud, Kris, Klein,...) and Humanistic (Carl Rogers, Gestalt, and Transactional Analysis), as they compose the main cornerstones of the studied model of psychotherapy.

1- Creative Process from a Psychoanalytic Perspective

Psychoanalysis proposes that creativity wells up from unconscious drives. There are different opinions about how this occurs, but the various psychoanalytic schools of thought generally suggest that creativity is a by-product of primary processes (Bergquist, 2000). Here are introduced the psychoanalytic contributions of Freud, Kris, Melanie Klein, Fairbairn, Winnicott, and Silvano Arieti.

a- Freud

The classical Freudian stance regarding creativity revolves around the concept of tension reduction and wish fulfillment with the end purpose of returning the individual to a state of homeostasis. According to Freud (1908), creativity serves as a mechanism by which this can be accomplished. Freud's description of sublimation and fantasy seeks to shed light on the unconscious processes involved in the creative act. Further, his motivational explanation of reduction of drive tensions and the restoration of homeostasis attempts to identify the intrinsic motivation within the creative person. In this case, we are looking at the unconscious drive tensions that seek relief, thus inspiring one to create.

b- Ernst Kris

Kris (1952) rejected the Freudian notion of creativity serving the purpose of flight from reality. Instead, creativity was a means of enriching reality with a new perspective. Kris emphasized the integration of id and ego, with the ego ultimately regulating the creative act. Kris' (1952) concept of regression in the service of the ego is a cornerstone of ego psychology's theory of creativity. This concept posits that the controlled balance between id and ego processes differentiates creative thought from psychotic thought disorder. While psychotic verbalizations may seem to be creative in that they tend to bring together disparate elements in unusual and complex ways, what is lacking is the control of secondary process, reality-oriented thought. Without such control, unconscious content becomes unbounded and cannot be organized in a meaningful and understandable way. Without the organizing influence of ego functions, the affective states, so essential to creativity, could only be experienced, not utilized.

c- Melanie Klein

Melanie Klein was to suggest that true artistic and creative activity were both rooted in depressive anxiety and the urge to make good the destructive fantasies. The child tries to recreate and repair the other it has destroyed, first by fantasies of omnipotent reparation, later by affectionate and healing gestures towards real others, constituting the drive towards creative effort. She also believed that anxiety is the spur to creative achievement. For Klein and Segal, it is through the creative capacity that the artist is able to establish a harmony between the inner and outer world (Glover, 1998).

d- Fairbairn

Fairbairn talked about the artistic creativity, and to him "art is not only a sublimated expression of repressed urges, but also a means whereby positive values are created in the service of an ideal" (Fairbairn, 1938a: 302, Cited in Clarke, 2004).

He reformulated Kris' (1952) ideas. Therefore, the idea of "regression to primary process thinking" becomes the activation of dynamic structures that are primitive because they have been unable to learn from experience, having been dissociated and repressed during infancy (Clarke, 2004).

e- Winnicott

Object relations theory is the basis of Winnicott's (1971) theory of creativity. According to object relations theory, creativity is both a by-product of and a means toward relationships, both fantasized and real. He defined creativity as a capacity to experience reality.

Winnicott (1971) perceived creativity to be a thing in itself that is present in all healthy individuals. The identification that the simple act of breathing or making a musical sound, *when experienced and enjoyed*, can be a creative act emphasizes that the notion of creativity is intricately and inextricably linked to our very sense of being. His broad definition of creativity is demonstrated in the following statement in which creativity is present when "anyone looks in a healthy way at anything or does anything deliberately, such as making a mess with feces or prolonging the act of crying to enjoy a musical sound".

Winnicott's (1971) exploration of children's development and play resulted in his theory of transitional phenomenon. This phenomenon draws an explicit link between the infant's intermediate area of experience between internal and external realities and the adult's use of this area in later creative activity.

Winnicott (1953) located creative activity in the transitional space, the area that contains illusion. The child eventually realizes through play and the manipulation of illusion that there is an external world, separate and apart from the self. The creator, in a similar but reversed sequence, first creates an illusion that then becomes transformed into reality. The illusion is constructed in the transitional space and involves the manipulation of thoughts and objects. The creator, as does the child with the transitional object, plays with these various elements in the transitional space.

The creator, according to to Winnicott (1965), does not depend on doxology to maintain a professional self-representation and ego ideal. Rather, he or she relies on inner resources, not requiring much support from external objects or the idealization of traditional schools of thought. This corresponds to Winnicott's false-self-true-self dichotomy. Creators turn inwardly and then create or modify the outer world in accordance with their hypersensitive perceptions and inner psychic processes. They create their outer world. This means that they do not mold their identities to be congruent with the current ideological system that has been implanted in the external world. In this sense they have achieved a true-self orientation.

f- Silvano Arieti

Arieti (1976) believed that the creative process involves a combination between the primary process and the secondary process modes of thinking in a magic synthesis. He labels the intuitive processes as primary and the intellectual as secondary. He then postulates the merging of the two as being a tertiary process. A way of being that enhances creativity. The longer version of this is:

"The *primary process*, for Freud, is a way in which the psyche functions, especially the unconscious part of the psyche. It prevails in dreams and some mental illnesses, especially psychoses. The primary process operates quite differently from the secondary process, which is the way of functioning of the mind when it is awake and uses common logic. Primary process mechanisms reappear in the creative process also, in strange, intricate combinations with secondary process mechanisms and in syntheses that, although unpredictable, are nevertheless susceptible of psychological interpretation. It is from appropriate matching with secondary process mechanisms that these primitive forms of cognition, generally confined to abnormal conditions or to unconscious processes, become innovating powers... I have proposed the expression *tertiary process* to designate this special combination of primary and secondary process mechanisms. .. . For accuracy's sake, I must point out that in a certain number of creative processes the matching is not necessarily between primary and secondary process mechanisms, but between faulty or archaic and normal mechanisms, all of which belong to the secondary process. For these combinations, too, I have used the name tertiary process".

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2- Creative Process from a Humanistic Perspective

a- Rogers

Carl Rogers, a humanistic psychologist, proposed that it is the human's tendency toward actualization, to become his/her potentialities that is the driving force behind creativity. He defines actualization as a directional trend, which is evident in all organic and human life. This trend is the urge to expand, extend, develop, mature, and express all the capacities of the organism or the self. He suggests that this tendency may become deeply buried under layers of psychological defenses or facades. He believes however that it exists in all individuals and only awaits the appropriate conditions for this tendency to be released and expressed (Selby, 2004).

Rogers (1961) discovered three internal conditions associated with creativity process. The first condition is an <u>openness to experience</u> that prevents rigidity. Rogers found that individuals with this quality tended to be less defensive when criticized. This translates into the ability to tolerate ambiguity and to receive conflicting information without closing one's mind to all possible contingencies, thus enhancing the possibility of creative resolution.

The second condition that Rogers (1961) discovered was the ability to evaluate situations according to one's own <u>personal standards</u>. This quality involves the ability to rely on internal evaluation rather than external evaluation. These individuals value their own opinions over opinions of others. This quality does not exclude feedback from others, however when the final judgment is made it is based upon internal evaluative factors.

The final condition proposed by Rogers (1961) is the <u>ability to experiment</u> with and engage in unstable situations. This quality involves the tendency to explore possibilities and to play with different concepts. This characteristic would be very much like "brain-storming", being open to as many different contingencies, no matter how silly or ridiculous they may seem. This quality often leads to creative resolutions that rigid thinking simply does not permit. Rogers believed that individuals that possessed these characteristics tended to be psychologically healthy.

b- Gestalt

Creativity, from Gestalt Perspective, is a significant criterion for health, well-being and intelligence. It reflects the ability to find new solutions and promotes the flexibility required to adjust productively during critical life events (Lobb and Lyon, 2003).

Zinker, a famous gestalt theorist (1977) wrote:

Creativity is a celebration of one's grandeur, one's sense of making anything possible. Creativity is a celebration of life-my celebration of life. It is a bold statement: I am here! I love life! I love me! I can be anything! I can do anything! Creativity is not merely the conception, but the act itself, the fruition of that which is urgent, which demands to be stated. It is not only an expression of the full range of each person's experience and sense of uniqueness, but also a social act-a sharing with one's fellow human beings this celebration, this assertion in living a full life. Creativity is the expression of the presence of God in my hands, eyes, brain-in all of me…Creativity is the breaking of boundaries, the affirmation of life beyond life-life moving beyond itself. ..Finally, creativity is an act of bravery…(p. 3).

The roots of creativity, according to gestalt theoreticians, need not to be sought in the creative's unconscious, because the act of creation is *not* as widely held, an abnormal function, but a basic natural potentiality of human existence. Creation is found at all levels of life and should be interpreted as indication of vigorous self-expression rather than a compulsive act of warped sexuality (litt, 1995).

Wolfgang Köhler, one of the originators of Gestalt psychology, demonstrated that chimpanzees could solve problems insightfully. Köhler showed that these primates were not limited to the mechanical trial-and-error method of learning, but that they could come up with creative solutions to problems by using what he called "insight". By this use of proto-theory, we may label apes as proto-scientists. Yet, interestingly enough, in contradiction of psychoanalytic theory, they never went through the phallic stage of libidinal development. Other scientists have shown, for example, that chimpanzees can be taught the rudiments of monetary economy, including hoarding. Yet these animals never had any toilet training problems. Now, many researchers have shown that, given paper and paints, primates will paint pictures. They have no oral fixations to regress to (litt, 1995).

Max Wertheimer (1945) looks at all creativity from another Gestalt perspective. He says that the process moves from one unstable or unsatisfactory situation (S1) to one of greater stability and thereby forms a new gestalt (S2) which includes the resolution of tension. Wertheimer believed that dividing the wholes into parts without losing track of the original totality was an important aspect of creative thinking. Wertheimer also says that in the creative act the individual perceives some features of the final S2 from the beginning of the process; these features are the means through which the individual recaptures the final situation. Unfortunately, Wertheimer's theory does not explain how restructuring of S1 into S2 actually occurs. The importance of his theory is the emphasis on the process as a whole rather than as a linear sequence. To Wertheimer, the creativity process was "one consistent line of thinking…[which sought] the nature of their [the elements] intrinsic interdependence."

c- Transactional Analysis (Williams, 2006)

Transactional Analysis, the understanding of human interaction that grew out of Berne's 1960s work, is a simplified neo-Freudian approach to human personality. Berne's scheme is based on three intra-psychic systems, called *ego states*: Child, Adult, and Parent, loosely analogous to Freud's id, ego, and super-ego.

The Child ego state is the natural uncontrolled and untutored energy of a child to explore, move, express itself, and instantly gratify its biological urges. Spontaneity, creativity, and liveliness are rooted in this ego state, as are selfishness, impatience, and other less charming characteristics of the immature human.

The Adult ego state grows out of the child's increasing contact with the world as he or she develops reality-based skills and learns to manipulate things and events. A person's ever-growing *how-to* knowledge comprises the contents of the Adult.

The Parent ego state comprises of neurological "recordings" of the pronouncements and behaviors of a person's parents and other early caregivers. Because so much parenting is oriented towards accepting or rejecting specific behaviors, the content of the Parent ego state is largely evaluative and judgmental, although the judgments may equally well carry the sweet flavor of approval or the bitter tang of condemnation.

Berne saw the personality in terms of interactions between all three of these phenomenological states. He represented them visually as a three-tiered stack of contiguous circles.

Berne's simple schema can be used to explain how different parts of the personality produce free-flowing creativity, possess technical competence garnered from previous experiences, and are capable of evaluation and self-criticism. Just as the Child, Adult, and Parent ego states work together to enable a spontaneous, effective, and self-controlled personality, so the Creator, Technician, and Critic must collaborate in the creative endeavor. Each is important.

This schema also clarifies various disorders of the creative process. For example, the unbridled Creator (un-served by a competent Technician and a rigorous Critic) will bring to the table a product that is free-flowing, but undisciplined and ineffective. The pure Technician, not in the service of a free Creator and a rigorous Critic, will bring a sterile but highly dexterous product. The premature Critic, preoccupied from the beginning with how good or bad the product is, will have trouble producing anything at all and will probably ask a lot of frustrated questions about creative block.

The schema can guide to the therapeutic intervention appropriate to the problem as well. Identifying where the imbalance exists (creative flow, technical competence, or critical rigor), and whether it is a deficiency or an excess, will go a long way towards defining the intervention that is needed.

B- Creative Product:

1- What is a Creative Product?

Giovacchini (1991) believes that, in terms of psychodynamic balance, there are two different types of creative products: scientific and artistic.

Clarke (2004), reviewing Fairbairn's theory on artistic creativity, believed that a creative product is a reconstruction of the self on a more realistic basis (the central ego becomes expanded by re-integrating previously split-off aspects from subsidiary selves), and the modification of the ego ideal in the direction of a less limited, more whole, internal object (the ideal object is reconstructed on the basis of the increased realistic powers available as a consequence of the changes in the central ego).

Gestalters think that closure is the end product of creativity, involving changes in the functional meaning, grouping, and reorganization of the items in the field until the gaps and difficulties in the problem are resolved. The field is restructured to restore harmony (Mackler and Shontz, 1965).

Taylor (1959) demonstrates that there are at least four types of creative products that reflect four levels of creativity. These are:

- **Expressive**: which relates to the freedom of expression, where originality of the product and the skill of the person are irrelevant (for example, spontaneous drawings by children).

- **Productive**: which relates to having certain skills and being able to use certain techniques to create new products (here expressive freedom is already restrained and held in check). In modern management or in methods of leadership, such productive creativity falls under the heading of routine, which in everyday speech carries a negative connotation.

- **Inventive:** signifies a degree of imagination in handling different materials, techniques, methods, but it does not lead to new ideas, only to new applications of old ones (researchers).

- **Innovative:** relates to seeking out and understanding the basic principles underlying any action or undertaking, leading to its modification (a change in a given theory). It requires a high level of abstract conceptualization.

Rakhawy (1986) believes that both creativity and psychosis stem simultaneously from the same psychological source and they progress in a dialectical pattern. Depending on the nature of their interaction/relation, different products take place, as follows:

- Exclusion: where both creativity and psychosis try to push each other away. The end product will be only one of them, either creativity or psychosis. The other is thrown out in deeper layers of the unconscious. Here, the creative outcome is called "alternative creative product". It is an alternative for psychosis, and also an alternative for a "higher creative product". It is manifested in literal, artistic, scientific,...etc forms of creative products, which are alternatives for psychosis and alternatives for creativity in the creative person's self.

- Banishment: where creativity and psychosis try to banish each other. The outcome is an intermediate solution or "non creative product", neither creativity nor psychosis, but a stable state of freezing, clinically manifested in personality disorders or the so called "states of normality".

- Contradiction: where creativity and psychosis neither push away nor banish each other in the earlier phases, but take their full-time to progress dialectically, though being in contradiction. This may end in a state of adherence, union and harmony that contains, assimilates and exceeds both of them. This is the "higher creative product", in which creativity contains/includes/assimilates psychosis. It influences the self of the creative person leading to radical change and growth (manifested in its extremes in Sufism experiences).

2- Qualities of a Creative Product

Barron (1988) identified four qualities of creative products when he reviewed the literature on creativity.

The first quality is that creativity is seen as an ability to respond adaptively to the needs of new approaches and new products. It is essentially the ability to bring something new into existence purposefully, though the process may have unconscious, as well as fully conscious components.

The second quality is that "something new" is usually the product resulting from a process initiated by a person.

The third quality identified by Barron (1988) is that the defining properties of these new products, processes, and persons are their originality, aptness, validity, fitness, and adequacy in meeting a need. Particular emphasis is placed on whatever is fresh, novel, unusual, ingenious, clever and appropriate.

The final quality outlined by Barron (1988) is that there is tremendous variation in creative products. For example, a novel solution to a problem in mathematics, the discovery of a new chemical process, composition of a poem, an innovation in law, etc., demonstrates the range of potential creative products. There are a myriad of domains in which creative products are produced.

C- Creative Person

Although the cognitive processes involved in creativity are the same for everyone, it is still evident that some people are consistently more creative than others and that people differ in their creative outputs over time (Dacey and Lennon, 1998). Thus, there are some differences that influence creativity of individuals.

1-   Primary Features:

Creative individuals have several primary features that distinguish them from their less creative peers:

- They have a rich body of domain-relevant knowledge and well-developed skills (Simonton, 2000).
- They find their work intrinsically motivating (Simonton, 2000 and Amabile, 1988).
- They tend to be independent, unconventional, and more risk-taking (Simonton, 2000).
- They have wide interests and a greater openness to new experiences (Simonton, 2000).

2-   Additional Characteristics

Research by Sternberg (1988) has revealed several additional characteristics:

- Skill in recognizing differences and similarities and making connections.
- Flexibility to change directions.
- Willingness to question norms and assumptions.
- "Discovery" orientation, which leads to view situations from multiple perspectives, to find problems, and to ask novel questions.

3-   Personality Traits:

According to Dacey & Lennon (1998) there are ten personality traits that are important to the creative person. These include:

1) Tolerance of ambiguity (Barron, 1988 and Torrance, 1975).

2) Stimulus freedom (Dacey, 1989 and Torrance, 1975).

3) Functional freedom (Dacey and Ripple, 1967).

4) Flexibility (Runco and Richards, 1997).

5) Risk taking (Sternberg and Lubart, 1995).

6) Preference for dis-order (Barron, 1988).

7) Delay of gratification (Sternberg and Lubart, 1995).

8) Freedom from sex-role stereotyping (Sternberg and Lubart, 1995).

9) Perseverance (Sternberg & Lubart, 1995 and Torrance, 1975).

10) Courage (Sternberg & Lubart, 1995 and Torrance, 1975).

The ten traits just listed are not the only traits found in creative individuals; however they seem to be the qualities that are most often found in research studies. The interesting feature about these traits is that they are not necessarily inborn traits. They can be acquired through intentional effort (Dacey and Lennon, 1998).

4-   Intelligence and Wisdom:

Sternberg (2001) proposed that there is a dialectical relationship between creativity and intelligence & wisdom. Intelligence is necessary for there to be creativity because not only is generation of novel ideas necessary but the critical analysis of novel ideas is also necessary. To be able to generate novel ideas, there must be some basic intelligence, but to further analyze those ideas that are generated, there must be higher intelligence. Beyond intelligence, there must also be wisdom because intelligence alone is not sufficient. Wisdom is considered to be the balance between creativity and intelligence relegating the novel ideas according to their appropriateness. It may be easy enough to generate novel ideas, but wisdom will distinguish the reasonable from the unreasonable. A creative and intelligent person may produce a novel idea, but without wisdom, the novel idea may be foolish or inappropriate.

D- Environmental Press on Creativity:

1- Family environment

There have been numerous studies that demonstrate the influences of family environment on the facilitation of creativity. Families who lack rigidity and rules, highly value humor and fun, use a nurturing parenting style, create living spaces dictated by internal rather than external standards, and recognize and encourage creative traits from an early age are more likely to produce creative children (Dacey, 1989).

Other studies found that adaptability within families and avoidance of rigidity are more likely to produce creative children (Gardner and Moran, 1990). Some creative adults were found to have had childhoods in which the parents were accepting, cooperative, and demonstrated love and high expectations (Mendecka, 1996).

The common theme that emerged across research literature on family environments and creativity is that the use of a nurturing parenting style fosters the development of creativity, especially when a structure is provided within which a child can operate freely and safely. The experience of empowerment that comes with a bounded freedom seems to encourage the development of creative children (Selby, 2004).

2- Societal/cultural environments

Research into societal/cultural influence on the development of creativity generally focuses on educational environments, societal re-enforcers, and culture's role. It can be inferred from the literature that if a particular environment is found to foster creative outcomes then it makes sense to determine whether or not those findings can be generalized to other similar environments, which in this case is the psychotherapeutic setting (Selby, 2004).

It appears that most educational systems suppress creativity (Dacey and Lennon, 1998). Sources of suppression include authoritarian teaching styles and traditionally structured classrooms (Adorno, et al., 1950), as well as peer pressure to conform (Hallman, 1967 and Torrance, 1975). Each source contributes to a decrease in levels of creativity. Nurturing relational styles and open classroom structure were found to result in greater levels of creativity.

Societal rewards are an important area of investigation as it relates to creativity. At the heart of this investigation is the concept of intrinsic motivation. Amabile (1996) posits that creativity increases when an individual is internally motivated to do a creative activity based upon one's own interest in and enjoyment of that activity when compared to an individual who is motivated by external rewards.

Numerous others (Lepper et al., 1973 and Lepper et al., 1982) have demonstrated that when too much extrinsic motivation is present, creativity is lessened. It has been determined that rewards can result in a narrowed focus on the task, accompanied by a desire to get the task done quickly while taking no risks. People begin to become controlled by the promised payoff and over time lose whatever intrinsic motivation they originally possessed.

Arieti (1976) suggests that creative genius occurs when three elements converge; the culture must be right, the genes must be right, and the interactions must be right. Culture must be ready and interested in what is being created. The creator's intelligence and level of creativity must be high enough and the interactions with significant others must be of the sort to spur on the creative act.

Models of Creativity:

In his book *"Creativity: the Magical Synthesis"*, Silvano Arieti (1976) catalogued eight models of the creative thinking process that were proposed during the period 1908 to 1964. Additional models have been proposed since. Because these models represent a piece of the theory of creativity -- how creative thinking proceeds and how creative ideas emerge over time -- it is instructive to review the lines of thinking implied by them.

Vinacke (1953) is adamant that creative thinking in the arts does not follow a model. In a similar vein, Gestalt philosophers like Wertheimer (1945) assert that the process of creative thinking is an integrated line of thought that does not lend itself to the segmentation implied by the steps of a model. But while such views are strongly held, they are in the minority. What follows is an overview of some known creativity models.

A- The Wallas' Model for the Process of Creativity

One of the earliest models of the creative process is attributed to Graham Wallas. Wallas (1926) proposed that creativity proceeds through four phases:

1- Preparation (definition of issue, observation, and study).

2- Incubation (laying the issue aside for a time).

3- Illumination (the moment when a new idea finally emerges).

4- Verification (checking it out).

Torrance (1988) asserts that Wallas' model is the basis for most of the creative thinking training programs available today. The inclusion of incubation followed by sudden illumination in this popular model may explain why so many people view creative thinking as a subconscious mental process that cannot be directed.

B- Barron's Psychic Creation Model

Barron (1988) has developed his four-phase, "psychic creation model."

1- Conception (in a prepared mind).

2- Gestation (time, intricately coordinated).

3- Parturition (suffering to be born, emergence to light).

4- Bringing up the baby (further period of development).

The tone of Barron's model argues the popular view of creativity as a mysterious process involving subconscious thoughts beyond the control of the creator (Plsek, 1996).

In contrast to the prominent role that some models give to subconscious processes, Perkins (1981) argues that subconscious mental processes are behind all thinking and, therefore, play no extraordinary role in creative thinking. Just because we cannot fully describe our thought processes does not mean that we are not in control of them. For example, we cannot begin to describe all of the subconscious mental processes that are engaged in the simple act of picking up a coffee mug. But we are certainly in control of the overall act.

Further, Perkins (1981) argues, just because random events play a part in some acts of creation, this should not be taken to imply that random events are the source of all acts of creation.

Weisberg's (1993) review of the lives of great creators and so-called "moments of invention" supports Perkins' points by demonstrating the years of conscious work and preparation on the part of the creator.

C- Rossman's Creativity Model

While some models make it appear that creativity is a somewhat magical process, the predominant models lean more toward the theory that novel ideas emerge from the conscious effort to balance analysis and imagination (Plsek, 1996). For example, Rossman (1931) examined the creative process via questionnaires completed by 710 inventors and expanded Wallas' original four steps to seven.

1. Observation of a need or difficulty.
2. Analysis of the need.
3. A survey of all available information.
4. A formulation of all objective solutions.
5. A critical analysis of these solutions for their advantages and disadvantages.
6. The birth of the new idea -- the invention.
7. Experimentation to test out the most promising solution, and the selection and perfection of the final embodiment.

Note that while Rossman still shrouds the "birth of the new idea" in mystery, his steps leading up to and following this moment of illumination are clearly analytical (Plsek, 1996).

D- Osborn's Seven-Step Model for Creative Thinking

Alex Osborn (1953), the developer of brainstorming, embraced a similar theory of balance between analysis and imagination in his seven-step model for creative thinking.

1. **Orientation:** pointing up the problem.
2. **Preparation:** gathering pertinent data.
3. **Analysis:** breaking down the relevant material.
4. **Ideation:** piling up alternatives by way of ideas.
5. **Incubation:** letting up, to invite illumination.
6. **Synthesis:** putting the pieces together.
7. **Evaluation:** judging the resulting ideas.

Note that Osborn implied purposeful ideation both in his notion of "piling up alternatives" and through his development of the rules of brainstorming as a tool for doing so (Plsek, 1996).

E- The Creative Problem Solving (CPS) Model

The systematic combination of techniques for directed creativity and techniques for analysis continues as a strong theme in several, more recently proposed models. Parnes (1992) and Isaksen and Trefflinger (1985) outline six steps in their popular creative problem solving (CPS) model. Tens of thousands of people have learned the CPS model and its associated tools through the seminars conducted by the Creative Education Foundation in Buffalo, NY.

1. **Objective finding.**
2. **Fact finding.**
3. **Problem finding.**
4. **Idea finding.**
5. **Solution finding.**
6. **Acceptance finding.**

Steps 3 and 4 (problem and idea finding) clearly require novel, creative thinking; while steps 1, 2, 5, and 6 require traditional skills and analytical thinking (Plsek, 1996).

F- Koberg and Bagnall's Universal Traveler Model

Koberg and Bagnall (1981) propose a similar balanced model in their popular book *The Universal Traveler.*

1. Accept the situation (as a challenge).

2. Analyze (to discover the "world of the problem").

3. Define (the main issues and goals).

4. Ideate (to generate options).

5. Select (to choose among options).

5. Implement (to give physical form to the idea).

6. Evaluate (to review and plan again).

Again, notice that ideation, the traditional focus of creative thinking tools such as brainstorming, is proceeded and followed by deliberate analytical and practical thinking. Also note the importance that Koberg and Bagnell place on accepting the situation as a personal challenge. This is consistent with the research into the lives of great creators that illustrates the importance of focusing and caring deeply (for example, Weisberg 1993, Wallace and Gruber 1989, Gardner 1994, and Ghiselin 1952). Finally, note that the final step of this model supports the notion of continuous innovation (Plsek, 1996).